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Date of mailing (day/month/year) 03 November 1998 (03.11.98)	Applicant's or agent's file reference 18547-305-3P
International application No. PCT/US98/05451	
International filing date (day/month/year) 19 March 1998 (19.03.98)	
Priority date (day/month/year) 20 March 1997 (20.03.97)	
Applicant CHEE, Mark	

1. The designated Office is hereby notified of its election made:

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19 October 1998 (19.10.98)

☐ in a notice effecting later election filed with the International Bureau on:
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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : C12Q 1/68	A1	(11) International Publication Number: WO 98/41657 (43) International Publication Date: 24 September 1998 (24.09.98)
(21) International Application Number: PCT/US98/05451 (22) International Filing Date: 19 March 1998 (19.03.98) (30) Priority Data: 60/041,435 20 March 1997 (20.03.97) US 60/073,853 2 February 1998 (02.02.98) US (63) Related by Continuation (CON) or Continuation-in-Part (CIP) to Earlier Applications US 60/041,435 (CIP) Filed on 20 March 1997 (20.03.97) US 60/073,853 (CIP) Filed on 2 February 1998 (02.02.98) (71) Applicant (for all designated States except US): AFFYMETRIX, INC. [US/US]; 3380 Central Expressway, Santa Clara, CA 95051 (US). (72) Inventor; and (75) Inventor/Applicant (for US only): CHEE, Mark [AU/US]; 3199 Waverly Street, Palo Alto, CA 94306 (US).		(74) Agents: LIEBESCHUETZ, Joe et al.; Townsend and Townsend and Crew LLP, 8th floor, Two Embarcadero Center, San Francisco, CA 94111-3834 (US). (81) Designated States: JP, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i>
(54) Title: ITERATIVE RESEQUENCING (57) Abstract The invention provides iterative methods of analyzing a target nucleic acid that represents a variant of a reference nucleic acid. An array of probes is designed to be complementary to an estimated sequence of a target nucleic acid. The array of probes is then hybridized to the target nucleic acid. The target sequence is reestimated from hybridization pattern of the array to the target nucleic acid. A further array of probes is then designed to be complementary to the reestimated sequence, and this array is used to obtain a further reestimate of the sequence of the target nucleic acid. By performing iterative cycles of array design and target sequence estimation, the estimated sequence of the target converges with the true sequence.		

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/05451

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) : C12Q 1/68
US CL : 435/6; 436/94

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 435/6; 436/94

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,525,464 A (DRMANAC et al) 11 June 1996, column 33.	1-15
Y, P	US 5,683,881 A (SKIENA) 04 November 1997, columns 9 and 14.	1-15

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search

04 MAY 1998

Date of mailing of the international search report

24 JUN 1998

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US98/05451

B. FIELDS SEARCHED

Electronic data bases consulted (Name of data base and where practicable terms used):

APS; DIALOG: MEDLINE, CA, DERWENT PATENTS, BIOSIS, EMBASE, SCISEARCH
search terms: sequencing by hybridization, reiterative or repeat or cycles

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 98/00704

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 96 17957 A (HYSEQ INC) 13 June 1996 see the whole document ---	1-33
X	EP 0 721 016 A (AFFYMAX TECH NV) 10 July 1996 see the whole document ---	1-33
X	WO 95 09248 A (ARCH DEV CORP ;DRMANAC RADOJE (US)) 6 April 1995 see the whole document ---	1-33
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search

4 June 1998

Date of mailing of the international search report

12/06/1998

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Hagenmaier, S

INTERNATIONAL SEARCH REPORT

Inter. Patent Application No.
PCT/US 98/00704

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DONG-JING FU ET AL: "A DNA SEQUENCING STRATEGY THAT REQUIRES ONLY FIVE BASES OF KNOWN TERMINAL SEQUENCE FOR PRIMING" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, vol. 92, no. 22, 24 October 1995, pages 10162-10166, XP000602286 see the whole document	1-33
A	BROUDE N E ET AL: "ENHANCED DNA SEQUENCING BY HYBRIDIZATION" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, vol. 91, April 1994, pages 3072-3076, XP000619675 see the whole document	1-33
A	CANTOR C R ET AL: "THE FUTURE OF DNA SEQUENCING METHODS AND APPLICATIONS" MASS SPECTROMETRY IN THE BIOLOGICAL SCIENCES, 1996, pages 519-533, XP000602992 see the whole document	1-33
A	DRMANAC R ET AL: "REQUIREMENTS IN SCREENING CDNA LIBRARIES FOR NEW GENES AND SOLUTIONS OFFERED BY SBH TECHNOLOGY" IDENTIFICATION OF TRANSCRIBED SEQUENCES. PROCEEDINGS INTERNATIONAL WORKSHOP, 1994, pages 239-251, XP000671141 see the whole document	1-33
A	WO 94 11530 A (UNIV BOSTON) 26 May 1994 see the whole document	1-33

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 98/00704

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9617957 A	13-06-1996	AU 4468796 A	26-06-1996
		CA 2206815 A	13-06-1996
		EP 0797683 A	01-10-1997
		FI 972429 A	06-08-1997
		NO 972535 A	06-08-1997
EP 0721016 A	10-07-1996	US 5556752 A	17-09-1996
WO 9509248 A	06-04-1995	AU 8072794 A	18-04-1995
		BR 9407712 A	12-02-1997
		CA 2172722 A	06-04-1995
		CN 1136330 A	20-11-1996
		CZ 9600905 A	16-10-1996
		EP 0723598 A	31-07-1996
		FI 961283 A	22-05-1996
		HU 75993 A	28-05-1997
		JP 9505729 T	10-06-1997
		NO 961165 A	23-05-1996
		NZ 275194 A	22-09-1997
		PL 313735 A	22-07-1996
WO 9411530 A	26-05-1994	EP 0668932 A	30-08-1995
		JP 8507199 T	06-08-1996
		US 5503980 A	02-04-1996
		US 5631134 A	20-05-1997